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ADAMS EVANS P.A.
301 SOUTH TRYON STREET, SUITE 2180
TWO WACHOVIA CENTER
CHARLOTTE, NC 28282-1991

EXAMINER	
CAVALLARI, DANIEL J	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,428	ECKROAD ET AL.	
	Examiner	Art Unit	
	Daniel J. Cavallari	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) *36-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 June 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/5/2005*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *20061120*.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-21, 22-29 & 30-35, drawn to a backup power supply system, classified in class 307, subclass 64.

II. Claims 36-42 & 43-53, drawn to a method of supplying electrical power, classified in class 700, subclass 286.

III. Claims 54 & 55, drawn to a computer program for providing power, classified in class 700, subclass 22.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the backup power supply process can be operated on a variety of UPS systems known in the art and not limited to the apparatus of I. The apparatus I can be operated in a variety of power transfer and operating schemes other than that of process II. In particular, backup power supply systems are commonly known in the art that operate in a variety of different schemes to switch between different sources.

Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, I is drawn to an apparatus which does not overlap in scope with the computer program of III nor is the apparatus and computer program obvious variants of one another. Furthermore, subcombination I has separate utility such as providing backup power whereas III is a computer program which could be used to control power supplied to a load. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Inventions II and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP §

806.05(e)). In this case the method II can be realized using analog circuitry and not requiring the computer program of III.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

The examiner acknowledges that a provisional election was received in writing on 12/7/2006 in which an election was made without traverse to prosecute the invention of group I, claims 1-35. Affirmation of this election must be made by applicant in replying to this Office action. Claims 36-55 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 7/5/2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

Those figures (ie. Figures 1A-2) should be designated by a legend such as -- Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the

Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 8 & 10 are objected to because of the following informalities:

In regard to Claim 8

Claim 8 recites the limitation "the VSC voltage controller" however a "VSC voltage controller" is not previously disclosed. There is insufficient antecedent basis for this limitation in the claim. The claim will be examined as best understood to mean "a VSC voltage controller".

In regard to Claim 10

The claim states "...configured to determine the mode..." however multiple modes have been discussed making it unclear what mode is being referenced. The claim will be examined as best understood to mean "a mode".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 18 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In regard to Claim 18

Claim 18 recites "wherein the storage control module is interchangeable with a second control module that is specifically configured for controlling the operation of a second electrical power storage subsystem". The claim fails to explicitly teach any particulars about how the storage control module is configured and is contradictory in that if it is "specifically configured for controlling the operation of a second electrical power storage subsystem" then it is unclear how it would be operating a first power storage subsystem to which it is connected. If it is capable of operating both power storage subsystems, it is unclear exactly how or what is being configured to make it different than another storage control module.

Because of the 112 problems with this claim, no art can be applied to claim 18.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 5, 7, 14, 22, 27, 28, 32, & 30-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to Claim 2

- The limitations of implementing the various modes without "conventional" components is unclear as the claims fail to state what these components are thereby making it impossible to determine exactly what structural limitations are being claimed.

Because of the 112 problems with this claim, no art can be applied to claims 2, 20, & 21.

In regard to Claim 5

- It is unclear what is meant by the phrase "integrated closed loop" control system. Particularly, it is unclear what is meant by "integrated" as it not stated what exactly the control system is being integrated with. The claim will be best examined to mean a power system incorporating a feedback loop.

In regard to Claim 7 & 27

- The limitation of a "voltage source converter current controller" is unclear as a "voltage source converter current controller" is not a standard piece of equipment and the phrase is confusing as a whole making it unclear exactly that which is being claimed. The claim will be examined as best understood to mean "a controller".

In regard to Claim 14

- Any acronym should be spelled out in its entity in the claim upon its first occurrence. Therefore, the term "SMES" should be spelled out in claim 14. The claim will be examined as best understood to mean "superconducting magnetics".

In regard to Claim 22

- The use of the term "and/or" is indefinite as it is unclear whether one or both limitations are being claimed. Either "and" or "or" should be used. The claims will be examined as best understood to mean "or".

In regard to Claim 27

- The use of the term "...static compensation" is not one ordinarily used in the art and therefore makes the claim unclear. The examiner notes that claimed limitations in parentheses are not read into the claim. However, in order to

advance prosecution of the case, the claim will be examined to mean wherein the VSC provides at least reactive power injection or absorption. If the applicant intended these limitations to be part of the claim, they should be positively recited in the claim and not in parentheses and the "/" should be replaced with an appropriate "and" or "or" and not both "and/or" which renders the claim indefinite as it is unclear which word "and" or "or" is being claimed.

Claim 28 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 28 states "...but does not include a power conditioner..." however claim 27 states that a power conditioner "...provides at least static compensation (reactive power injection/absorption)" which the examiner notes is considered power conditioning thereby making the claim unclear.

In regard to Claim 32

- The claim states "wherein the charge mode is capable of operating during at least one of the other multiple modes of operation" however it is unclear how the charge mode can operate during another mode as the device would no longer be operating in the original mode of operation.

Claims 30-35 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are:

In regard to Claim 30

- Those components and their relationship with the various operating modes. The applicant has identified various "modes" of operation but fails to provide any structural limitations or connection between structural components and the various operational modes.
- Various systems are disclosed (multimode control system, current control system, voltage control system) however no structural components nor any connection between the system and a structural component is recited making the various "systems" indefinite.

In regard to Claim 31

- A "standby" mode and "energy storage discharge mode" are disclosed however there is no recitation of the connection of the mode to any physical components.

In regard to Claim 33

- The claim recites "...wherein the multimode control system is further configured to provide an alternate power source mode" failing to provide any structural components or support for the "alternate power source mode".

In regard to Claim 34

- There is no structural support for either the control systems nor the modes of operation making the interaction between the two unclear.

Because of the 112 problems with claims 30-35, no are can be applied to claims 30-35.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-9, 12, & 22-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasegawa et al. (US 6,563,234).

Hasegawa et al. (hereinafter referred to as Hasegawa) teaches:

In regard to Claim 1

An electrical power source system comprising:

- An electrical power storage subsystem (110d) (See Figure 1).
- A control system (read on by the controller depicted in Figure 2) coupled with the power storage subsystem (100d of Figure 1) and configured to provide a plurality of modes of operation including a static compensator operational mode and uninterruptible power supply operational mode [The examiner notes that the claims fail to provide particular limitations in regard to the specific "mode" of operation other than that of a "static compensator" and "uninterruptible power supply" therefore the use of the term "mode" is nominal] and to control transitions between each mode (static compensation and uninterruptible power supply) including operation in more than one mode at the same time [The examiner notes the system taught by Hasegawa provides uninterruptible power by connecting utility (ie. 201-203) to a common electrical bus (2) along with other sources (ie. 100a-100c, 204, 205) such that if the sources (204, 205) fail to provide the necessary power to the load (310) the power generators (201-203) provide uninterruptible power to compensate. Hasegawa further teaches that an "instantaneous voltage drop" which is referring to a loss of power from a primary source (See Column 1, Lines 53-60) can be prevented by the rechargeable battery system (See Column 3, Lines 30-33, Column 1, lines 25-37 & Figure 1) and the system of Hasegawa provide static compensation while providing uninterruptible power (ie. when the system is supplying power from the battery) (See Column 3, Lines 30-33 & Column 5, Lines 44)].

In regard to Claim 3

- An electrical power generator (201 & 100c) wherein the control system (Figure 2) is further coupled to the electrical power generator (via electrical buses) and configured to provide a generator mode (read on by a "mode" in which power is being supplied by the generator (201).

In regard to Claim 4

- Wherein the control system is further coupled to the electrical power generator and is further configured to provide a multiplicity of generator connection modes, including at least a dc-connected generator mode (read on by the connection of 100c) and an ac-connected generator mode (read on by the connection of 201) [The examiner notes that the limitation of "configured to provide" is nominal as no actual limitations of how it is providing the particular mode is recited other than the fact that is "configured to provide" to which the examiner states that Hasegawa teaches a system control system which always for such "modes", as discussed above, thereby the control system is "configured to provide" said modes].

In regard to Claim 5

- Wherein the control system is a closed loop control system [The examiner notes that a closed loop control system is taught by Hasegawa and shown in figure 2

wherein a feedback loop from the bus system (3) is processed and controls the storage element (10) which in return control the bus (3)].

In regard to Claim 6

The control system comprises:

- A current control system (52) coupled with the electrical power storage subsystem (10) (See Figure 2) and the electrical power generator (201) (See Figure 1).
- A voltage control system (20) coupled with at least the electrical power storage subsystem (10).

[The examiner notes that the "current control system" and "voltage control system" are nominal recitations of a limitation and fail to provide any positive or physical limitations and only infer that they are related to "current" and "voltage"].

In regard to Claim 7

- The current control system includes a controller (31) coupled with a pulse pattern generation unit (31) and the pulse pattern generation unit (30) couples with the energy storage system (10) and is configured to supply control signals to the energy storage system (10) (See Figure 2 & Column 5, Line 61 to Column 7, Line 11).

In regard to Claim 8

- The voltage control system (20) includes a VSC voltage controller (21) coupled with the pulse pattern generation unit (31) and the pulse pattern generation unit coupes with the energy storage system and is configured to supply control signals to the energy storage system (See Figure 2 & Column 5, Line 61 to Column 7, Line 11)

In regard to Claim 9

- The energy storage system (110d) (See Figure 1) includes a VSC (20) coupled with the energy storage unit (10) wherein the energy storage unit is configured to store electrical energy, and the VSC (20) is configured to draw energy from the energy storage unit and supply electrical energy to the energy storage unit (10) (See Figure 1 & Column 4, lines 37-48).

In regard to Claim 12

- The storage system comprises a battery (110d) (See Figure 1).

In regard to Claim 22

- A static compensator (100) (See Figure 2).
- An uninterruptible power supply (read on by the power supply system incorporating a plurality of sources (202-205) (See Figure 1).

- A multimode control system (21) coupled with the STATCOM and the UPS wherein the multimode control system is configured to control the operation of each of the STATCOM and the UPS to cooperate the STATCOM and the UPS to simultaneously provide reactive power or real electrical power in any combination before, during or after a disturbance or outage on the electrical grid (See Column 3, Lines 46 to Column 4, Line 2 and Column 5, Line 31) [The examiner notes that by the controller controlling the amount of reactive and real power on the line, it is controlling the operation of the UPS (power sources 201-205)].

In regard to Claims 17 & 19

- Wherein the control system includes at least one storage control module (ie. 100a) specifically configured for controlling the operation of the electrical power storage subsystem (See figure 1) [The examiner notes the limitation of being "specifically configured" does not provide any specific limiting factors as the claim fails to recite how it is specifically configured or distinguishable from another controller therefore the controller taught by Hasegawa who teaches a controller configured to control the operation of an additional power supply (ie. 204) reads on the claim limitations].
- Wherein the storage control module is chosen from the group comprising: a software configuration, a hardware configuration, and a combination of a software and a hardware configuration (See Figure 2).

In regard to Claim 23

- A generator (201) and wherein the multimode control system is further coupled with the generator (via bus 2) and wherein the control system is further configured to cooperate the generator with the STATCOM and the UPS to provide real and reactive electrical power (See Figure 1).

In regard to Claim 24 & 25

- A current control system (32) coupled with the electrical power storage subsystem (10) (See Figure 2) and the electrical power generator (201) (See Figure 1).
- A voltage control system (20) coupled with at least the electrical power storage subsystem (10).

[The examiner notes that the "current control system" and "voltage control system" are nominal recitations of a limitation and fail to provide any positive or physical limitations and only infer that they are related to "current" and "voltage"].

In regard to Claim 26

- The control system includes: a detection and mode selection unit coupled with the current control system and voltage control system (read on by the current and voltage detection devices (51 & 52) (See Figure 2) and configured to signal the current control system and the voltage control system to activate and deactivate the current control system and the voltage control system [The

examiner notes that mode selection in this case is determining what type of power compensation to supply] (See Figure 2).

In regard to Claims 27 & 28

- Wherein the STATCOM includes a voltage source converter (20) coupled with the energy storage unit, wherein the VSC provided at least static compensation (See Figures 1 & 2) [The examiner notes that a converter by its very nature of converting power which comprises of both real and reactive components will provide reactive power injection or absorption].

In regard to Claim 29

- Wherein the energy storage unit is chosen from the group comprising: a battery, a flywheel, an SMES,, an electrochemical capacitor, and a combination thereof (See Figure 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa in view of Toy (US 6,191,500).

Incorporating all arguments above, Hasegawa fails to teach a detection and mode selection unit configured to determine a mode of operation and a solid state breaker coupled with the detection and mode selection unit configured to decouple a load from the grid and mode selection unit configured to signal the breaker to open and close.

Toy teaches a UPS system incorporating a mode selection unit (load shedding control system) configured to determine a mode of operation (ie. overload) and is configured to signal a breaker to open or close a switch dependant on the mode (See Paragraph 8, Lines 59-67) wherein the switch is taught as a solid state breaker (See Column 6, Lines 52-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the detection and mode selection unit and solid state breaker taught by Toy with the UPS system of Hasegawa in which to connect and disconnect the load from the grid (2) (See Hasegawa, Figure 1). The motivation would have been to protect the load and power supply system in the event of an overload condition.

Claims 13 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa in view of Wacknov et al. (US 2002/0175522).

Incorporating all arguments above, Hasegawa teaches the use of wind power, solar power, a battery, nuclear, thermal, and hydroelectrically power (See Figure 1) but fails to explicitly teach the use of a flywheel or electrochemical capacitor.

Wacknov et al. teaches a power supply system incorporating various different power supply sources including a electrochemical capacitor and flywheel (See Paragraph 63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate an electrochemical capacitor or flywheel as taught by Wacknov et al. in the system of Hasegawa. The motivation would have been to take advantage of the electrochemical capacitors high rate of charge and discharge and high cycle efficiency and the flywheel offers a simple and cheap energy storage means.

Claims 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa in view of Kehril et al. (US 6,392,856).

Incorporating all arguments above, Hasegawa teaches the use of wind power, solar power, a battery, nuclear, thermal, and hydroelectrically power (See Figure 1) but fails to explicitly teach the use of superconducting magnetic energy.

Kehril et al. teach a power supply system incorporating superconducting magnetic energy storage (See Column 5, Line 56 to Column 6, Line 11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the superconducting magnetic energy storage taught by Kehril et al. with the power supply system of Hasegawa. The motivation would have been to take advantage of the improved power quality characteristics of

superconducting magnetic energy including the short time delay during charge and discharge.

Claims 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa in view of Jungreis et al. (US 6,134,124).

Incorporating all arguments above, Hasegawa teaches the use of wind power, solar power, a battery, nuclear, thermal, and hydroelectrically power (See Figure 1) but fails to explicitly teach the use of compressed air energy storage.

Jungreis et al. teach a UPS system incorporating compressed air energy storage (See Column 2, Lines 42-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the compressed air energy storage taught by Jungreis et al. with the system of Hasegawa. The motivation would have been to take advantage of the low energy consumption of compressed air energy storage systems.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Cavallari whose telephone number is (571)272-8541. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571)272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Cavallari

November 22, 2006

CHAU N. NGUYEN
PRIMARY EXAMINER